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Sensation Seeking Among Experienced Whitewater Kayakers

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To the Graduate Council:

I am submitting herewith a thesis written by Lisa Marie Ivester entitled "Sensation Seeking Among Experienced Whitewater Kayakers." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Recreation and Sport Management.

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Sensation Seeking Among Experienced Whitewater Kayakers

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ABSTRACT

Whitewater kayaking is an adventure sport that has been continuously growing in popularity (Brymer, 2010). A better understanding of the risk involved could assist programmers, marketers, and decision makers in the future. This study explores sensation seeking in experienced whitewater kayakers. Demographic variables such as age, sex and skill level are studied to make conclusions about risk perception. Kayakers were recruited nation-wide via social media to participate in a survey involving sensation-seeking and demographic questions. The study consisted of 409 participants who completed the self-identifying survey. Past sensation-seeking literature pertaining to adventure sports suggests that there is a correlation between the sensation-seeking trait and risk taking. The findings of this study support the hypothesis that younger experienced kayakers score higher on the sensation-seeking scale and older experienced kayakers. Using SPSS data analysis software, it was discovered that 60.25 percent of respondents scored as high sensation seekers. Of the four subscales within the sensation-seeking scale, the thrill and adventure seeking subscale had the highest scores of 78% sensation seeking. Also, perception of ability and preference of rapid class results indicate that respondents of this study often paddle at or one class above their perceived ability level while whitewater kayaking.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE
INTRODUCTION AND GENERAL INFORMATION

History of Kayaking

While humans have used canoes and kayaks as transportation for hundreds, if not thousands of years, whitewater paddling as a sport began to develop in the 1900's. "It was a sport based on the thrill of exploration and danger, and the development and mastery of newly found technique and skills" (Taft, 2001, p. 1). The appeal of the sport is much the same as rock climbing and skiing, and paddling often attracts the same participants.

As early as the 1880's, members of the Appalachian Mountain Club (AMC) used native wood canoes to explore whitewater rivers. It wasn't until around 1914 that Alexander Forbes, a member of the AMC, designed a kayak for paddling rivers to be more stable (due to sitting lower than a canoe) and shed more water (due to the covered deck). Kayaks were certainly invented before 1915, but native kayak designs did not have specific designs for whitewater (Taft, 2001). New materials such as fiberglass and aluminum that developed during World War II allowed the advancement of kayak designs. As a result, it also allowed paddlers to begin exploring more difficult rivers. The 1970's are considered the golden age of paddling. This era includes the first Olympic appearance of whitewater slalom racing and the introduction of plastic boats (Taft, 2001). From the 1990's to present day, boat designs have continued advancing and the sport has progressed to running bigger, more technical and more dangerous

rivers and rapids. Some rivers that were considered “pushing the limit” of Class V in paddling, are now considered pre-cursor rivers for stepping up to other more difficult rivers. Are more risks being taken as kayakers are paddling bigger and steeper drops? Is the risk still the same and just more accepted?

Types of Whitewater Kayaking

There are different kinds of whitewater kayaking. For example, kayaking can be categorized into river running, play boating, creek running, racing and slalom. These categories of kayaking also have different shapes and sizes of kayaks to accompany them. These kayaks have varying degrees of volume and edge on the hull, or bottom of the boat, as well.

River Running

Rivers can be high volume continuous whitewater or low volume drop-pool style and vary from region to region. This original style of paddling involves low volume, medium length kayaks that are now designed as “all around, all terrain” kayaks (Taft, 2001, p. 306).

Play Boating

Surfing holes and waves and performing tricks is the main purpose of play boating. Play boats are short and low volume, which allows a paddler to be able to use the water to gain momentum to loop the kayak in the air.

Creek Running

Creeks are generally smaller and lower volume than a river. Creeks are characterized by steep rapids that are formed by large boulders and rocks. This often creates dangerous features like ledge holes and sieves (water flowing under and through rocks). Creek boats are high volume and are designed to turn quickly.

Racing

While slalom racing has been popular for some time, river and creek racing has risen in popularity in recent years. Boats as long as twelve feet are being used to race on many rivers across the country. Often racers paddle alone, one at a time, and are timed on the stretch of river. Some races are head to head, like a marathon, where all of the racers start at the same time.

Slalom

Slalom courses consist of flags hanging above a section of river that kayakers must paddle through and around. Slalom involves making sharp turns and using the current of the water to move through the course. Slalom kayaking and canoeing are an Olympic event.

Research Problem

Participation in the sport of whitewater kayaking has grown rapidly over the past two decades (Brymer, 2010). As Fiore (2013) similarly stated; whitewater kayaking is “fast becoming the most popular new adventure sport” since images have been used in advertising for various products. Despite its popularity, there seems to be a stereotype

that extreme sports such as kayaking are risky and dangerous, and that participation in the sport is solely for the risk takers and adrenaline seekers (Brymer, 2010). This stereotype does not explain the vast difference in the population of whitewater kayakers, especially across age. The intent of this study is to explore the differences between the demographic variables of age and skill level on the perception of risk in whitewater kayaking. The research will aim to deconstruct the misconception of how risk is perceived by kayakers of all ages. Are there differences in the sensation seeking among young and old experienced whitewater kayakers?

Significance

A better understanding of the perception of risk that whitewater kayakers experience is important for several reasons. The risk and danger that is discussed is inherent to the sport of whitewater kayaking. Understanding how participants process and make decisions involving risk of injury and death will provide adventure educators and kayak instructors with a framework to teach adventure recreation activities such as kayaking. This research may reveal reasons or pressures that whitewater kayakers choose not to participate in the sport on certain sections of river or specific rapids. Understanding the decisions that these kayakers of different ages make can also benefit adventure educators as they teach. Many instructors, especially if they are new to the field, may not understand that beginners are not experienced risk takers. Robinson (1992) stated that “In seeking to provide high quality recreation opportunities, recreation managers are required to devise strategies which consider the experiences sought by this specific recreation group. To achieve this goal, the recreation manager

requires an understanding of the complex nature of the risk recreation experience and factors which influence enduring involvement in such activities." Furthermore, understanding what people are looking for in a whitewater recreation experience can be useful in marketing ecotourism and adventure tourism opportunities (Ewert, 2013). Marketing is about knowing the target audience and what their expectations will be. Having insights into target audience ages and personality traits such a sensation seeking can help kayak companies create boats and gear for these user groups.

Next, understanding the motivations and risk perception of user groups can aid in policy making and land planning for public lands. Many settings in which kayaking takes place are managed for a single use, but in reality are used for many activities. For example, the upper stretches of the designated Wild and Scenic Chattooga River in South Carolina was managed for fish habitat and recreational fishing for many years while kayakers struggled with the Forest Service to have access to paddle the headwaters of the river (American Whitewater, 2014). Recreation resource managers would benefit from diverse information to guide management of public lands and waterways in which these activities take place. Knowing how users of different ages, gender and experience levels perceive risk and make decisions on the river would be useful information for organizations and planners to design the policies and recreation opportunities of an area (Ewert, 2013). This research will also assist in the public knowledge of the sport of whitewater kayaking and understanding why people choose to participate in the inherently dangerous activity.

Based on the issues stated above, this research will attempt to provide a unique insight into the differences in how participants of various ages and experience levels perceive and respond to the inherent risk in the sport of whitewater kayaking.

CHAPTER TWO
LITERATURE REVIEW

There are several psychological motivators that contribute to leisure in modern society. Stress management, relaxation and escape, and a sense of adventure and challenge are examples (McLean & Hurd, 2012). Society and culture play a considerable role in how we define risk and what is considered risky. Our culture has been accused of being risk averse, meaning we seek safety and strive to eliminate all danger to ourselves (Frey, 1991). Because of this, interest and conversation of risk is expanding to include scholars, policy makers, social agencies and the general public. In fact, the idea of risk is so central to our culture that we have created a business of risk analysis, in which professionals assess, regulate and manage risk for public and private entities (Frey, 1991). An example of risk analysis in outdoor education is the creation of the accident potential model, which is widely used in outdoor recreation programs to aid in the creation of risk management plans. (Hale, 1984). Risk analysis deals with managing technological and natural hazards but does not consider voluntary risk-taking. Lyng (1990) stated that this absence is in part due to the view that anticipated rewards are the primary motivation for risk taking. Furthermore, Lyng (1990) suggested that more research is needed on what makes risk taking necessary for the well-being of certain people.

Defining risk can be difficult and somewhat abstract. A simple definition of risk is the uncertainty about the outcome of an event or action. Frey (1991) suggested this definition can be expanded to include a possibility of significant loss or gain (p. 138).

When discussing risking and personality, Levenson (1990) defined risk taking as any purposive activity that entails novelty or danger sufficient to create anxiety in most people (p. 1073). This can be either physical or social, or a combination of the two. According to Frey (1991), values, self-concept, ethical stances, identity, resources, quality of life, personal relations, role alignment, or status all fall within the confines of social outcomes of risk (Frey, p. 137).

Risk is very closely related to sport. Sport itself is a setting in which athletes take risks regarding the safety of their physical bodies as well as the aforementioned social constructs. While participating in sport, the loss or gain has a consequence that may cause the person to redefine self in some way. This permanence makes entering risky sport situations more serious. Frey (1991) mentioned that it also "acknowledges that participation produces feedback that tells us something about ourselves" (p. 138). McLean and Hurd (2012) reiterate this by stating that adventure recreation, which is inherently risky, has been shown to enhance psychological well-being (p. 128).

According to recent data from the outdoor industry, participation rates in recreational activities that involve risk have increased drastically since 2009. Specifically, the number of whitewater kayakers has increase by 35% between 2009 and 2010 (Ewert, 2013). With the increase in participation, injuries and deaths in the sport have also increased (Fiore, 2003).

The sport involves navigating rivers with rapids that are graded on a scale from I to VI in difficulty. As the class of rapids increase, the technicality and expertise needed

also increases, as does the risk of injury or death if a mistake is made (Fiore, 2003). Table 1 explains the difficulty rating system.

Fiore (2003) studied injuries associated with whitewater rafting and kayaking and found that the number of incidents are very similar when compared with other adventure sports. In conclusion, Fiore suggested that equipment changes and education on river safety may reduce injuries for new boaters but that it would likely not be effective for experienced whitewater kayakers because they would neither need nor respond to educational efforts. Instead, Fiore suggested more research on risk taking behavior in elite athletes is needed.

Similarly, Brymer (2010) described that in all sport risk is about the probability of physical danger (2010). The phenomena of how people understand the probability of physical danger and make a decision to partake in the activity has been researched extensively in regards to drug use, smoking, and sexual behavior but there is little research that specifically studies the sport of whitewater kayaking. To some, activities such as driving a car are more dangerous and pose greater risk of injury than outdoor activities such as paddling. This illustrates perception as an important part of risk taking. Perceived risk involves a subjective perception of potential for injury or death (Berman & Berman, 2002).

Brymer (2010) presented three psychological perspectives to analyze risk taking in extreme sports. These perspectives argue that personality traits and previous experiences compel a person to put their life at risk through extreme sports.

Table 1: International River Rating System

Class I	Easy, small waves. Clear passages with no obstacles
Class II	Medium waves. Clear passages with moderate difficulty.
Class III	More difficult. Longer rapids and rougher obstacles. Large irregular features with rocks and other obstacles. Requires maneuvering. Scouting recommended.
Class IV	Difficult. Rapids are generally longer, steeper with heavy obstruction. Powerful and irregular waves. Requires precise maneuvering. Scouting required if unknown rapid.
Class V	Extremely difficult. Rapids are long, difficult and often multiple with no interruption. Congested and obstructed by rocks, trees, etc. Steep with large drops. Scouting mandatory but difficult. Risk of death is significant.
Class VI	Extreme and expedition-like in nature. Often considered “unrunnable”. For groups of extremely skilled boaters only. Once a rapid is run repeatedly, it is re-classified to Class 5. Risk to boaters and swimmer is high.

(Fiore, 2003)

These perspectives frame participation as a need or search for uncertainty and uncontrollability as well as a focus on undertaking an activity where death is probable for excitement. Brymer questioned these theories and claims that extreme sport participants are careful and prefer to remain in control.

In the study, 15 extreme sport participants were interviewed using a phenomenological perspective to collect a detailed description of a phenomena based on the structure and meaning of an experience. The one question that guided the interview process was 'What is the extreme sport experience?' Results showed that extreme sport participants did not see the activities as risky or dangerous and they did not participate for an adrenaline rush. As people participate in extreme sports, their perception of risk decreases while their perception of skill increases (McLean & Hurd, p.128). This correlation does not mean that the risk of injury or death has decreased. Only one's perception that there is less risk has decreased. Overall, outcome uncertainty was not a part of the experience for the participants. Preparation and control were so important that in many cases, the participants delayed the activity for years to develop the skills required (Brymer, 2010).

Brymer's (2010) study used participants who were outside of the age group typically discussed in studies about extreme sports. The interviewees were between the ages of 30 and 75 years old. To further test his conclusion, testing across adolescent and mature ages may help to clarify.

Similarly, Ewert (2013) asked questions about motivational structure for adventure recreation participants and how it varied with respect to gender, activity type

and level of experience. Again, age was not taken into account. Over six summers between 2000 and 2008, participants of a university based outdoor program were asked a 40 item questionnaire. Questions 1 through 18 measured level of experience and questions 23-40 measured motivation. 801 respondents over the six years were measured using a three factor structure including social, sensation-seeking, and self-image. Ewert found that females had higher social motives than males as well as those participated in canoeing rather than climbing, or whitewater kayaking. For the sensation-seeking factor, which Brymer suggested did not account for motivation, Ewert found that participants in rock climbing had significantly higher sensation-seeking motives than those of canoeing and sea kayaking. Also, sensation seeking motivations were high in those with higher levels of experience. In regard to the self-image factor, whitewater kayakers reported higher self-image motives. Advanced experience participants also reported self-image motives. Ewert concluded that those with more experience have more sensation-seeking motives when participating in adventure recreation. Further research is suggested for this subject including the importance of risk claiming that it is poorly understood and overestimated.

The sensation seeking that Ewert used in his instrument of data collection was based on Zuckerman's sensation seeking theory.

Sensation Seeking Theory

Zuckerman's theory of Sensation Seeking is based on the theory that there are consistent differences in optimal levels of stimulation and arousal in individuals.

“Zuckerman described sensation seeking as a trait defined by the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risk for the sake of such experience” (Goma-i-Freixanet, 2004).

Similarly, Brymer (2010) states that Zuckerman’s sensation seeking theory claims that participation in extreme sports such as whitewater kayaking results from “an inherent need for novel experiences and intense sensations obtained by taking physical risks.”. Behavior defined as sensation seeking behavior can be viewed as the outcome of a conflict between states of anxiety that vary as a function of novelty and appraised risk (Schneider et. Al, 2007). This means that as a person becomes more confident and comfortable with an activity through repeated experience, they may start to push their limits and seek new sensations. Personality, genetic predispositions and environment all play a role in a person becoming a sensation seeker (Zuckerman, 1994).

There are psychophysiological and sociological factors that factor into the development of a sensation seeking adult. High sensation seekers may produce lower levels of dopamine, which is a natural chemical produced by the body that helps generate a sense of satisfaction. These high sensation seekers “may tend to pursue activities that stimulate dopamine production” (Schneider et. Al, 2007). Levenson (1990) affirms that those who consistently search for experiences that include high stimulation have low arousability, otherwise defined as low autonomic responsiveness. These persons with low autonomic responsiveness seek to increase their low arousal to an optimum level (Levenson, 1990). Perception of risk may even have a culturally dictated component that outdoor leaders need to be aware of with their clients or participants

(Berman & Berman, 2002). Social factors that may affect sensation seeking development include nurturance or non-nurturance by the family unit and or the society and culture that one develops in. Coakley (2004) notes that the influence of significant others such as family and friends is the most influential force involved in sport socialization. In a study on social risk, Frey (1991) affirms that risk perceptions are based on cultural factors. Perception of risk is related to public reflection of the danger of a situation. Frey also states that risk is "an integral part of the North American value structure, is generally valued positively, especially if success is the outcome of the risky action taken". Schneider (2007) also discussed similar findings in a qualitative interview based study of elite adventure racers. Five general themes emerged from the study which consisted of ten interviews with adventure racers. The first theme is risk socialization, which refers to how participants were socialized within risk from childhood to adulthood. This study revealed that the participants felt their decision-making process was different and more calculated in comparison with their childhood (Schneider et. Al, 2007).

While there are qualitative studies regarding risk in adventure sport, most of the previous research on risking taking in sport has used quantitative methods that rely on various personality profiles such as sensation seeking. The Sensation seeking scale has been validated repeatedly by various studies in sport (Levenson, 1990).

Sensation seeking theory, originally created in the 1960s and published for the first time in 1979, has been updated several times since its original publication. The total

length of the scale is forty items, ten items for each of the four subscales. The four subscales are described in Table 2.

Several studies have been conducted using Zuckerman's Sensation seeking scale including psychophysiological and psychopharmacological research. Goma-i-Freixanet (2004) conducted a thorough review of contribution of the sensation seeking trait to sports with physical risk. For the review, high physical risk sports are identified as those with a high probability of death or injury as consequence of participation. Whitewater kayaking, climbing, and parachuting are examples of high risk sports. Medium physical risk sports are those with a higher probability of being injured rather than death.

It also includes sports where the arena is limited and there is a static environment. Medium risk sports include football, boxing and karate. Low physical risk sports have a low probability that a fatal injury will occur. Running, bowling and golf are good examples of low risk sports (Goma-i-Freixanet, 2004). The studies reviewed all dealt with the sensation seeking scale but differed in several ways including gender, sport type, level of competitions, and type of population (college students, general population etc.) The studies are grouped into three categories: studies that compare high risk sports with sports of similar risk level, studies that compare high risk sport with low risk sport, and student that compare high risk sport with controls. For the first category, the sport persons did not differ from each other on the sensation seeking scale. The second category review showed that the subjects differed on all four of the sensation seeking subscales as well as on the total scale (Goma-i-Freixanet, 2004). The third category review revealed that the tendency was still maintained with high

Table 2: Sensation Seeking Subscale

Thrill and Adventure Seeking (TAS)	Items reflecting a desire to engage in activities or sports involving some unusual sensations and involving some risks beyond conventional sports.
Experience Seeking (ES)	Items indicate openness to new kinds of sensations and experiences through art, music, drugs, and an unconventional lifestyle.
Disinhibition (DIS)	Items describe the seeking of exciting sensations and experiences in social situations such as parties, social drinking and sexual activity.
Boredom Susceptibility (BS)	Items reflect an intolerance for repetitious and predictable kinds of experience in routine work or with dull people, and a restlessness when the individual cannot escape from routine or sameness of stimulation.

(Zuckerman, 1979, 1994, 2007)

TAS (thrill adventure seeking) scores, ES (experience seeking) and the total scale. According to Zuckerman, all sensation seeking scales decline with age (Zuckerman, 1979). Overall, the extensive review of research implied that particular sports that one is more likely to participate in may be determined by whether one scores high or low on the scale (Goma-i-Freixanet, 2004). Jack and Ronan (1998) hypothesized in a research study that individuals who participate in high risk sports would score higher on the total sensation seeking scale as well the subscales than those involved in low risk sports. The research found that sensation seeking is indeed less relevant in low risk sports participants but does not account for age, family involvement or physical ability of the participants, which is a limitation of the study (Jack & Ronan, 1998). Furthermore, since Zuckerman stated that sensation seeking scores decline with age, further research of age and risk perception will allow professionals to better understand risk perception.

Sensation seeking in mountain climbers has been studied thoroughly. Cronin (1991) researched sensation seeking in twenty mountain climbing participants against twenty control participants. The mountain climbers measured significantly higher on the Thrill and Adventure Seeking (TAS) and the Experience Seeking (ES) subscales. The TAS subscale reflects a desire to participate in risky and adventurous sports while the ES represents engaging in new sensations through music, art, travel and drugs (Cronin, 1991). A very similar study conducted on hang gliders and automobile racers compared with bowlers as low sensation seekers had comparable results. Straub (1982) found that male athletes participating in high risk sports scored higher in total sensation seeking than male athletes participating in low risk sports.

Slanger and Rudestam (1997) also used sensation seeking to study motivation and disinhibition in high risk sports. In this research, sensation seeking was combined with self-efficacy theory to determine risk taking behaviors. By combining sensation seeking theory and self-efficacy theory, Slanger and Rudestam (1997) aimed to fill in gaps of why people will take risks in one area of their lives and not in others (p.356). Self-efficacy theory is defined as a person's perception of their ability to reach a goal and the expectation that one can master a situation and produce a positive outcome (Slanger and Rudestam, 1997). A relevant example is the ability of a whitewater kayaker to run a class V rapid without any issues.

Twenty participants from the sports of rock climbing, skiing, whitewater kayaking, and piloting a small plane were selected. Twenty athletes from low risk taking sports were also selected as controls. All participants were given six scales in the following order: Sensation seeking scale; death anxiety scale; repression sensitization scale; Sherer's self-efficacy scale; Physical self-efficacy scale-1; Physical self-efficacy scale-2 (Slanger and Rudestam, 1997). Results included a significant difference on the Thrill and Adventure seeking scale between the low and high risk groups. There was a significant difference between the low risk and high risk group for the physical self-efficacy scale but no statistical difference of the general self-efficacy scale (Slanger and Rudestam, pp. 362-365).

Furthermore, Robinson (1992) created a descriptive model of risk recreation by researching not only the psychosocial theories of risk perception but the process of determining situational risk, the processes that delimit the peak experience, and the

post participation self-evaluation process that influences prolonged involvement in the activity. Robinson (1992) attested that there are two crucial attributes to risk recreation. First, the participant must be capable of "attending to, efficiently processing, and responding effectively to an array of task relevant stimuli in an environment which is rich in sensory stimulation, and related to this, operating in a purely autonomous manner- that is, demand a willingness to accept responsibility for making and acting on, decisions which many have critical consequences".

The proposed risk recreation model included five stages; 1) Attraction: Seeking and coping with risk 2) Cognitive appraisal of situational risk 3) Decision making: Approach/Withdrawal 4) Performance Experience 5) Intuitive-Reflective Appraisal. Robinson goes on further to explain stage one by stating that two personality traits are present create a potential for risk recreation involvement. These traits are the need for stimulation and a strong autonomy orientation (Robinson, 1992). Robinson related stage one of his recreation involvement to Zuckerman's sensation seeking theory as well. As the theoretical risk recreation involvement model evolves, it explains how the participant starts with initial attraction to the activity and ends with enduring involvement. Further research to prove validity of this model is needed as it is entirely theoretical and generic in nature. Robinson suggested applying it to a broad spectrum of participants while taking type of activity, skill level and experience into account (Robinson, 1992).

Similarly, but with a different purpose, Schuett (1994) conducted a survey regarding environmental preference among whitewater kayakers. The survey asked questions regarding skill level and environmental preference. Schuett (1994) reported

that there are many dimensions that can affection satisfaction of river users. The study revealed that whitewater kayakers appear indifferent to comfort facilities such as restrooms, paved access roads, or the presence of others. Schuett (1994) suggested that the experience itself may be such an intense experience that the environment is of less concern. The study also revealed that experience and skill level were a variable for environmental preference in kayakers. Novice and intermediate kayakers were less likely to be disturbed by human sights or sounds while on the river compared to advanced whitewater kayakers. The advanced kayakers may be more concerned with improving skills. The lure of the activity could also be the risk of paddling through remote rivers and being on one's own (Schuett, 1994). This research shows that satisfaction level and environmental preference change as a participant becomes more proficient at paddling. Further research should question whether risk perception and motivations change as a paddler progresses.

Evans also researched why people participate in whitewater kayaking using a slightly different perspective. Rather than focusing on the risk involved in the sport, Evans aim was to gain a better understanding of kayaker's motivations related to autonomy and competence based on gender and age. This study used self-determination theory and basic psychological needs theory to drive the research regarding motivation (Evans, 2012). The relationship between age and motivation discussed is relevant to the relationship between risk perception and age that is in question. The Leisure Motivation Scale was used to assess motivation in 300 whitewater kayakers in an online survey. Results concluded that a kayaker's age

correlated with a decrease in intellectual, competence/mastery, and stimulus seeking (Evans, 2012). The results indicate that the preference of kayakers change as they age. Limitations of this research include the lack of measure of experience. Evans also suggests to include the influence of age on the types of rapids people prefer and have the ability for (Evans, 2012).

Past literature has framed the topic of whitewater kayaking by studying motivations, environmental preference, proposed risk theories, and sensation seeking but many seem to limit the study by excluding age as a variable to determine risk perception.

CHAPTER THREE
MATERIALS AND METHODS

Participants

This study used a large sample size to collect the most accurate data on risk perception and sensation seeking. Participants in the study included those who have experience in the activity of whitewater kayaking. The goal was to collect a sample with participants who vary in age, gender and experience level. Participants include whitewater kayakers from all regions of the United States. Participants were recruited from various social media groups. Participants range from intermediate to expert experience in whitewater kayaking and also range from 18-85 in age. No one under the age of 18 was recruited and no responses indicated an age under 18 in the data. Selection of participants was based on the respondent's self-identification as a whitewater kayaker.

Procedures

Participants in the study were asked to complete an online survey. The survey was made available online for a period of four weeks during the fall of 2016. While the target sample size for this study was 300 participants, the online recruiting method resulted in 409-recorded responses. Open and closed Facebook groups that are kayaking specific were the main area of outreach. The survey was posted to the following Facebook groups/pages: Knoxville area visuals; Durango River Ralliers;

Chattanooga Area Boating Info; University of Tennessee Whitewater Paddlers; Southeast creek Visuals; Western NC Creek Visuals; Clemson Area Paddlers; Smoky Mountain Paddling Club; Women of the Green; Women's Whitewater Group; and The Fort Lewis Whitewater Club. The survey was also posted on internet forums dedicated to whitewater kayaking and adventure sports including the following: MountainBuzz.com, BoaterTalk.com, Paddling.net, and Boof.com.

The survey consisted of questions pertaining to demographics as well as questions pertaining to whitewater kayaking experience, risk taking motivation and sensation seeking. The sensation seeking survey questions used a forced answer method while the demographic and motivation questions used a multiple-choice format. The socio-demographics that were asked included age, sex, region, class of whitewater preferred, ability to paddle whitewater, frequency of occurrence, time (in years and months) as a kayaker, and introduction method. Participants were asked to identify their skill level based on the International Whitewater Class System described in Table 1.

Data Collection

Data was collected by internet survey. Internet surveys were created using Qualtrics. Approval from the Institutional Review Board (IRB) was obtained prior to distributing and collecting data from the survey. For Facebook groups, a message was posted, which included an introduction to the survey, purpose statement, an invitation to participate, and the link to the survey itself. For internet forums that were used to recruit participants for this study, the same information was posted on a message board. An

explanation of the study was also included on the message board. Participation in the study did not result in reward.

In the study, sensation seeking is measured using the Sensation Seeking Scale (SSS-V) as developed by Marvin Zuckerman. The full 40-question scale was cut in half to 20 questions for the purpose of this study. The survey measures the four subscales of thrill and adventure seeking (TAS), boredom susceptibility (BS), experience seeking (ES), and disinhibition (DIS). Five questions from each subscale were included in the survey. The reason for cutting the survey in half was to create an easier and quicker online survey for participants in order to gather as many respondents as possible for the study. The process to eliminate 20 questions was a lengthy process that included reflection on which questions were more central to risk perceptions and whitewater kayaking. Many of the items ask similar questions in different wording. In these cases, I chose one or the other to keep for the survey. For example, one item reads, “There are some movies I enjoy seeing a second or even a third time” while another item similarly ready “I don’t mind watching a movie where I can predict what will happen in advance.” Both of these questions are essentially asking the same questions, only with different words. Another example of this is item “Heavy drinking usually ruins a party because some people get loud and boisterous” while another item is “Something is wrong with people who need liquor to feel good.” Both of these non-sensation seeking items have similar repercussions, so only one is used. Next, some questions were eliminated because of the dated nature of the question. The original 40-question survey had language and items focused on ideas that used to be more controversial. For example, I

removed item “I stay away from anyone I suspect of being gay or lesbian” as well as “Its better if two married persons begin their sexual experience with each other.” These two questions raise issues that are now more generally accepted by the general population than when the survey was originally created. The survey tool is found in Appendix 3, while the entire sensation seeking scale that includes item eliminated from this study’s survey is found in Appendix 4. The researcher chose SSS-V because it has shown to be valid and reliable in over two decades of previous research (Zuckerman, 1983). Slanger and Rudestam (1997) state that reliabilities of the 40-item total score range from .83 to .86. Individual subscale reliabilities include .77 to .81 (TAS), .61 to .65 (ES), .74 to .78 (BS), and .57 to .65 (DIS). Retest reliabilities after three weeks are .94 (Zuckerman, 1979).

Data Analysis

Age was measured in eight data sets: 18-24 years old, 25-34 years old, 35-44 years old, 45-54 years old, 55-64 years old, 65-74 years old, 75-84 years old, 85 and older. Sex was measured by male and female. Six regions were included for participants to select where they most often paddle. Those regions included New England: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont; Mid Atlantic: New Jersey, New York, Pennsylvania, and Delaware; Midwest: Illinois, Indiana, Michigan, Ohio, Wisconsin, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota; South: Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Tennessee, Arkansas, Louisiana,

Oklahoma, Texas; West: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming; and Pacific: Alaska, California, Oregon, Washington, Hawaii.

Demographic questions relating to rapid classifications (I through V) include which class rapids are most preferred to paddle and which the kayaker feels they have the ability to paddle. The differentiation of enjoyment/preference and ability was made to assess the kayaker's skill. This distinction may also lead to insight in how many kayakers paddle to their top ability.

To test statistical significance, SPSS is used. Using a test of group differences, the hypothesis is tested against the age group variable to determine whether younger experienced kayakers score higher on the SSS-V than older experienced kayakers. Overall sensation seeking of the entire sample is tested with test of association. To test sensation seeking across different age groups, a one-way ANOVA test is used. An independent T-test is used to compare sensation seeking by gender.

CHAPTER FOUR
RESULTS AND DISCUSSION

Results

Demographic Results

Several findings and conclusions are made from this research. Of the entire sample, 76.5% were male while 23.5% were female. The largest percentage of respondents were between the ages of 18-24, 25-34 and 35-44. Figure 1 illustrates the sample broken down by age categories. This suggests that kayaking is a popular sport among young to middle age adults. Older people may kayak less due to any number of reasons. Kayakers younger than 18 are not accounted for in this research. Future research should include minors under 18 years to gain a better understanding.

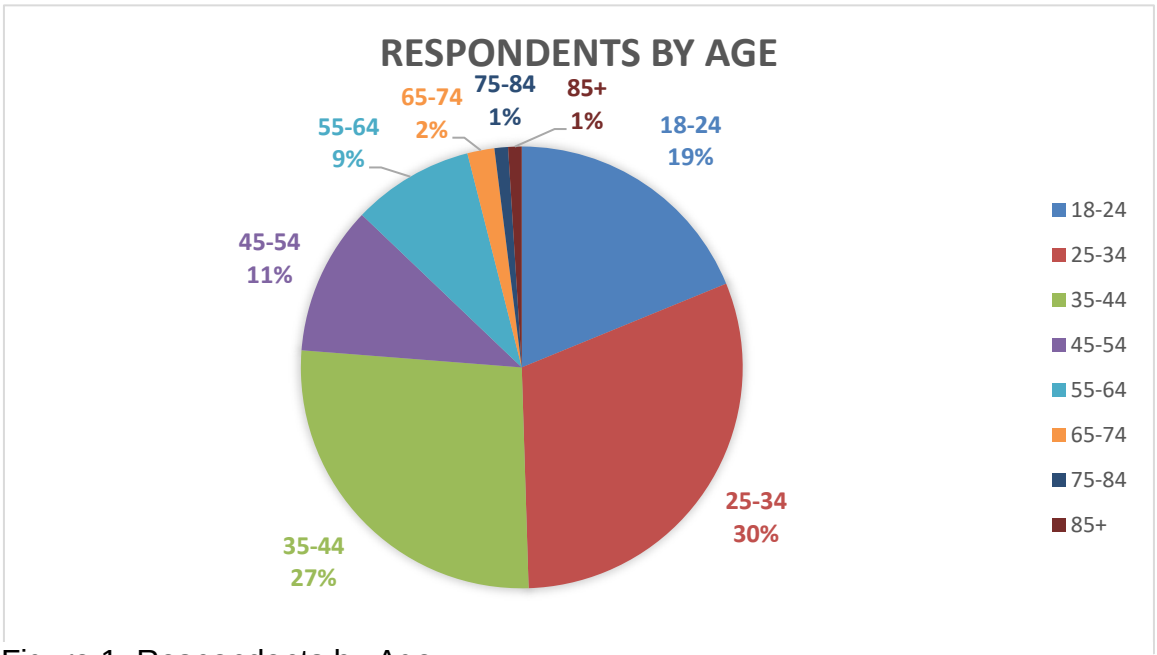

Figure 1: Respondents by Age

Figure 2 illustrates the sample broken down by region of paddling. Sixty-two percent of respondents most often paddle in the Southern region of the United States. The high number of respondents in this area may be due the location of the research and the Facebook groups chosen to gather participants. It may also be due to the popularity of the area among whitewater kayakers. The southern region of the United States because of the warm temperatures and moderate to high average rainfall. Figure 3 represents frequency of paddling per month. Twenty percent of respondents paddle once a month. Thirty-six percent of respondents paddle 2-5 times a month and 27% paddle 6-10 times a month. Only 17% of respondents paddle 10 or more times a month. Mean participation rate is 11.2 years. Lowest reported time of participation is 2 months and highest time of participation is 40 years.

The class of rapids or rivers that respondents feel comfortable and most often paddle offers insights into how often kayakers will push their limit within the sport. Overall, respondents most prefer to paddle class IV whitewater, closely followed by class III. Respondents most often paddle class V whitewater, followed by class IV. Class V+/VI is only preferred by eight respondents. Zero respondents indicate that they paddle class V+/VI most often. This indicates that respondents most often paddle at or just above the level at which they prefer and feel most comfortable by one grade on the international whitewater rating scale. Figure 4 illustrates the relationship. According to this research, kayakers are most commonly introduced to the sport of whitewater kayaking by friends or self-discovery. Collegiate and non-profit outdoor programs also seem be popular introduction methods.

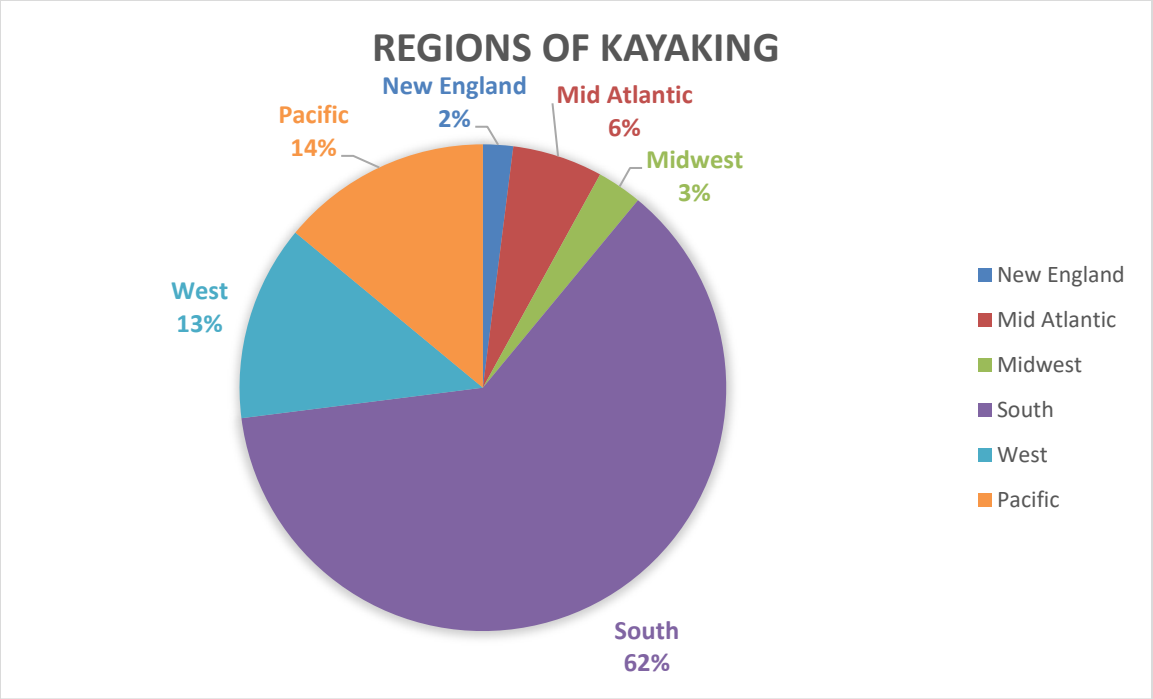

Figure 2: Region of Kayaking

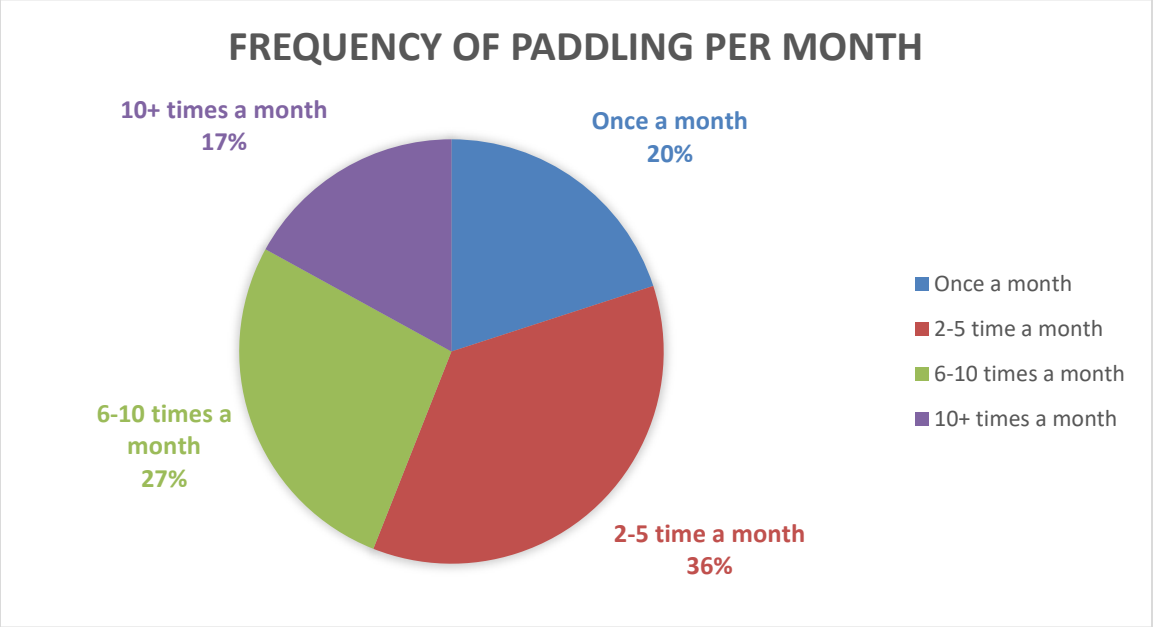

Figure 3: Frequency of paddling per month

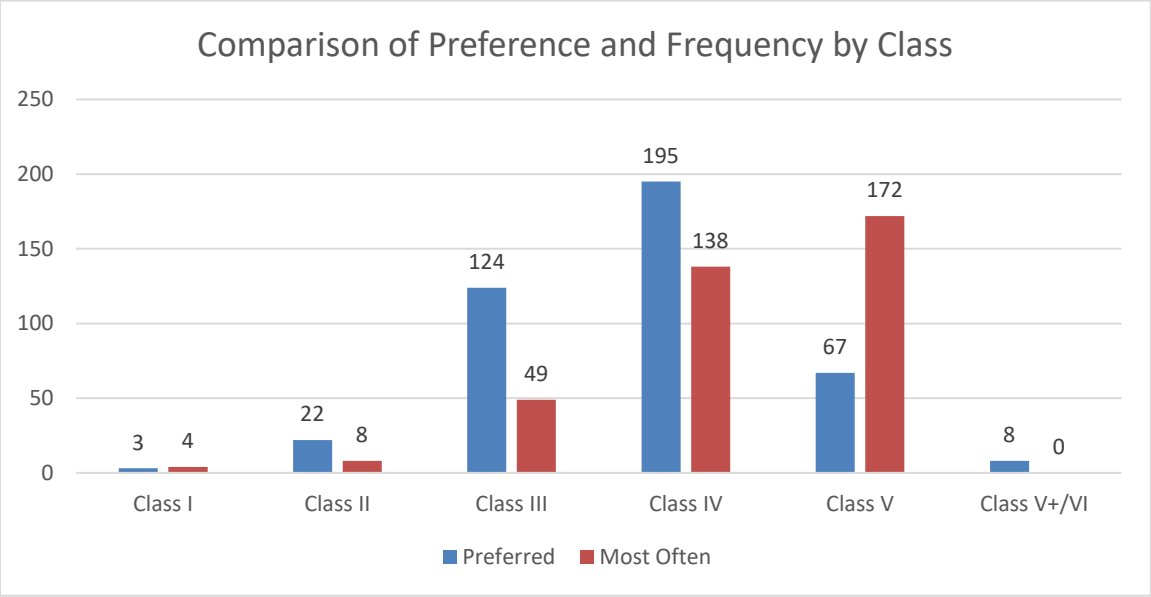

Figure 4: Comparison of Preference and Frequency by Class

Twenty-five percent of respondents reported that a friend introduced them to the sport while 19% reported that they were self-taught. Seventeen percent of respondents reported that they learned from a collegiate or non-profit outdoor program. Eight percent were introduced through professional lessons while 16% reported a family member introduced them. Surprisingly, only 6% were introduced to kayaking through a commercial whitewater rafting experience. Nine percent of respondents reported "other" when asked how they were introduced. Common "other" methods of introduction are "raft guiding", "summer camps", and "boy scouts".

Sensation Seeking Results

For three out of the five boredom susceptibility questions, more respondents chose the answer that did not reflect the sensation-seeking trait. For the remaining two questions, slightly more respondents chose the answer corresponding with the sensation-seeking trait. For example, the sensation seeking item "I usually don't enjoy a movie where I can predict what will happen in advance" was chosen more. Also, the item "I get very restless if I have to stay around home for any length of time" was the more popular answer. Overall, 38% of kayakers who chose to participate in the study scored high on the BS scale, as shown in Table 3. Sixty-two percent of kayakers scored low on the boredom susceptibility subscale. This result suggests that respondents of this study are not participating in the sport out of boredom of routine. For four out of five experience-seeking questions, more respondents chose the answer that reflects sensation-seeking. The item "I often find beauty in the clashing colors and irregular

forms of modern paintings" was answered equally with sensation seeking and non-sensation seeking answers. Respondents score high on the ES subscale as show in Table 4. In regards to the experience seeking subscale, 75% of respondents reported sensation seeking trait answers while only 25% did not. Results of the DIS questions in Table 5 were surprising. Ninety percent of respondents chose "I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional or illegal." This question was the only one out of five disinhibition questions that resulted in high sensation seeking trait answers. Overall, 50% reported sensation-seeking traits while 50% reported non sensation seeking on the scale. Every question on the TAS subscale in Table 6 had significantly higher reports of sensation seeking trait answers. On average, 78% answered with the sensation-seeking trait while 22% did not. The TAS subscale may be the most relevant to whitewater kayaking because of its definition, close relation to sports, and thrill. The item with the highest report of sensation seeking was the item "I would like to go scuba diving", which suggests the respondents have a comfort with water sports such as whitewater kayaking. The Thrill and Adventure seeking subscale may be the most relevant subscale regarding the sport of whitewater kayaking. Overall, the items reflect the desire for thrill and sensations through sports. It was expected that this subscale would have the highest scoring results of all of the four subscales in the total survey. Because of this, the questions that were chosen from the original 10, were the questions that were most closely related to kayaking or adventure sports. The respondents of this study are high Thrill and Adventure sensation seekers as well as overall high sensation seekers.

Table 3: Boredom Susceptibility Subscale Results

Boredom Susceptibility	Sensation Seeking		Non Sensation Seeking	
	Responses	Percentage	Responses	Percentage
Q1: I get bored seeing the same old faces. I prefer quiet parties with good conversation.	113	27%	300	73%
Q2:I dislike people who do or say things just to shock or upset others. When you can predict almost everything a person will do or say, he/she must be a bore.	65	16%	348	84%
Q3: I usually don't enjoy a movie where I can predict what will happen in advance. I don't mind watching a movie where I can predict what will happen in advance.	269	65%	144	35%
Q4: I prefer friends who are excitingly unpredictable. I prefer friends who are reliable and predictable.	113	27%	300	73%
Q5:I get very restless if I have to stay around home for any length of time. I enjoy spending time in the familiar surroundings of home.	226	55%	187	45%

Table 4: Experience Seeking Subscale Results

Experience Seeking	Sensation Seeking		Non Sensation Seeking	
	Responses	Percentage	Responses	Percentage
Q1: I like to explore a new area, river, or strange city by myself, even if it means getting lost. I prefer a guide when I am in a place I don't know well.	342	83%	71	17%
Q2: I like to try new foods that I have never tasted before. I order the dishes with which I am familiar, to avoid disappointment.	338	82%	75	18%
Q3: I would like to take off on a trip with no planned or definite routes or timetables. When I go on a trip I like to plan my route and timetable fairly accurately.	207	50%	206	50%
Q4: I often find beauty in the clashing colors and irregular forms of modern paintings. The essence of good art is in its clarity, symmetry of form and harmony of colors.	328	79%	85	21%
Q5: People should dress in individual ways even if the effects are sometimes strange. People should dress according to some standard of taste, neatness and style.	327	79%	86	21%

Table 5: Disinhibition Subscale Results

Disinhibition	Sensation Seeking		Non Sensation Seeking	
	Responses	Percentage	Responses	Percentage
Q1: I like wild and uninhibited parties. I prefer quiet parties with good conversation.	97	31%	316	77%
Q2: I like to have new and exciting experiences and sensations, even if they are a little frightening, unconventional or illegal. I am not interested in experience for its own sake.	372	90%	41	10%
Q3: I like to date people who are physically exciting. I like to date people who share my values.	191	46%	222	54%
Q4: Even if I had the money, I would not care to associate with rich persons like those in the jetset lifestyle. I could conceive of myself seeking pleasures around the world with the jetset lifestyle.	162	39%	251	61%
Q5:I feel best after taking a couple drinks. Something is wrong with people who need alcohol to feel good.	206	50%	207	50%

Table 6: Thrill and Adventure Seeking Subscale Results

Thrill and Adventure	Sensation Seeking		Non Sensation Seeking	
	Responses	Percentage	Responses	Percentage
Q1:I sometimes like to do things that are a little frightening. A sensible person avoids activities that are dangerous.	284	69%	129	31%
Q2: I would like to try kite surfing. I would not like to try kite surfing.	334	81%	79	19%
Q3: I would like to learn to fly and airplane. I would not like to learn to fly an airplane.	304	74%	109	26%
Q4: I would like to go scuba diving. I prefer the surface of the water to the depths.	396	96%	17	4%
Q5: I would like to go skydiving. I would never want to try jumping out of a plan with or without a parachute.	283	69%	130	31%

As shown in Table 7, in total, 60.25% scored with the sensation-seeking trait while 39.75% did not. While this number is more than half of the respondents, it is not a very large percent. To understand the relationship between age and sensation seeking, the dataset was analyzed using age. For overall sensation seeking and all subscales together, there was a statistical significance of .000 between groups 18-24 and 45-54 and 55+.

Table 7: Total Sensation Seeking Results

Subscale	**Sensation Seeking**	**Non Sensation Seeking**
Boredom Susceptibility	38%	62%
Experience Seeking	75%	25%
Disinhibition	50%	50%
Thrill and Adventure Seeking	78%	22%
Total Sensation Seeking	**60.25%**	**39.75%**

Age Comparison Results

Each age group data set was analyzed to determine sensation seeking and non-sensation seeking responses. Table 8 illustrates statistical significance of overall sensation seeking. Table 9 below illustrates how many responses were in each age group and what percent of those responses were sensation seeking and non-sensation seeking. The 18-24 age group had 79 responses and 64% scored as sensation seekers while 36% did not.

Table 8: Overall Sensation Seeking ANOVA test

ANOVA					
TOTAL					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.469	4	.117	5.773	.000
Within Groups	8.678	427	.020		
Total	9.147	431			

Table 9: Sensation Seeking by Age Comparison

Age Group	# of Respondents	Sensation Seeking	Non Sensation Seeking
18-24 years old	79	64%	36%
25-34 years old	126	62%	38%
35-44 years old	115	63%	37%
45-54 years old	43	58%	42%
55-64 years old	34	57%	43%
65-74 years old	10	47%	53%
75-84 years old	2	43%	57%
85 years or older	0	0%	0%
Total	**409**	**60.25%**	**39.75%**

The 25-34 age group had the largest response rate at 126. Sixty-two percent scored as sensation seekers while 38% did not. Sixty-three percent of the 115 respondents in the 35-44 age group scored as sensation seekers on the scale while 37% scored as non-sensation seekers. Forty-three respondents were in the 45-54 age group. Fifty-eight % were sensation seekers while 42% were not sensation seekers. Next, respondents in the 55-64 age group scored as 57% sensation seekers and 43% non-sensation seekers. There were 34 respondents in the 55-64 age group. Only 10 respondents self-identified as being 65-74 years old, which resulted in 47% sensation seeking and 53% non-sensation seeking. Lastly, 2 respondents were 75-84 years old, which resulted in 43% sensation seeking and 57% non-sensation seeking. No respondents reported being 85 years or older.

For the statistical analysis and significance ANOVA test, all respondents reporting 55 years of age and older were grouped together. For the TAS subscale, there was statistical significance of .006 between 18-24 year olds and those who are 55+ years of age. An example of this can be found in Table 10. For the ES subscale, there was no statistical significance. This can be seen in Table 11. This may be due to the definition of the experience seeking subscale that includes sensations of art and music. The DIS subscale did show statistical significance of .000 between the age groups of 18-24, 25-34, 35-44 and 55, which can be seen in Table 12. For the BS subscale, there was a statistical significance of .023 between the age groups of 18-24 and 45-54, which is seen in Table 13. Furthermore, average years of participation in the sport of kayaking increased as age increased.

Table 10: Thrill and Adventure Seeking ANOVA test

ANOVA - TAS					
	Sum	df	Mean	F	Sig.
Between Groups	.795	4	.199	3.657	.006
Within Groups	23.215	427	.054		
Total	24.010	431			

Table 11: Experience Seeking ANOVA test

ANOVA - ES					
	Sum	df	Mean	F	Sig.
Between Groups	.037	4	.009	.199	.939
Within Groups	19.633	427	.046		
Total	19.670	431			

Table 12: Disinhibition Seeking ANOVA test

ANOVA - DIS					
	Sum	df	Mean	F	Sig.
Between Groups	1.466	4	.367	7.545	.000
Within Groups	20.742	427	.049		
Total	22.208	431			

Table 13: Boredom Susceptibility ANOVA test

ANOVA - BS					
	Sum	df	Mean	F	Sig.
Between Groups	.784	4	.196	2.876	.023
Within Groups	29.093	427	.068		
Total	29.877	431			

This is a positive relationship between age and number of years kayaking, as seen in Figure 5 and Figure 6. There is a negative relationship with age and sensation seeking, meaning that older age groups scored lower on the sensation seeking scale than younger age groups, which supports the hypothesis of this research. However, in total the respondents did not score as high on the sensation seeking scale, only 60.25%, as hypothesized.

There are several reasons older age groups in this study may score lower on the sensation seeking scale. It is possible that older age groups have health reasons that may limit agility and strength. It is also possible that social obligations could limit sensation seeking.

While this may be true, recreational sports, as opposed to more conventional athletic sports such as football, soccer etc, draw more older populations. Sports like whitewater kayaking that are less competitive and easier to participate in because of the lack competition and organized nature may draw more participants in the middle ages or older ages. An example of this would be the baby boomers generation. More than 76 million people are considered to be baby boomers. This generation typically is described as work hard, play hard and spend hard (McLean and Hurd, 2012). However, the pattern of leisure involvement may begin to change as this recreation group ages, their children grow up and start their own families, and their bodies age. In older generations, or those who are 60-70+ years of age, it may be difficult to find communities to get involved in recreational activities such as kayaking in a fun and safe way.

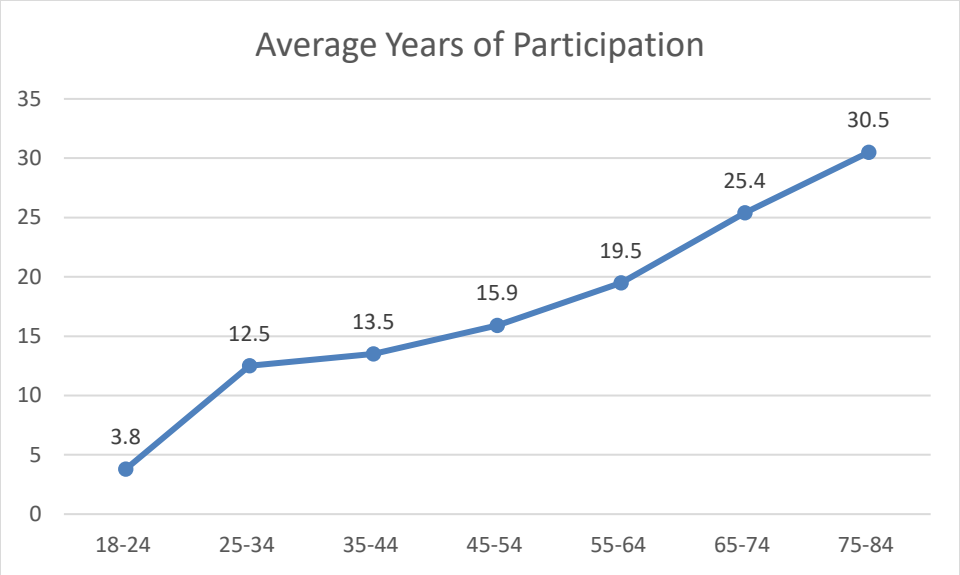

Figure 5: Average Years of Participation

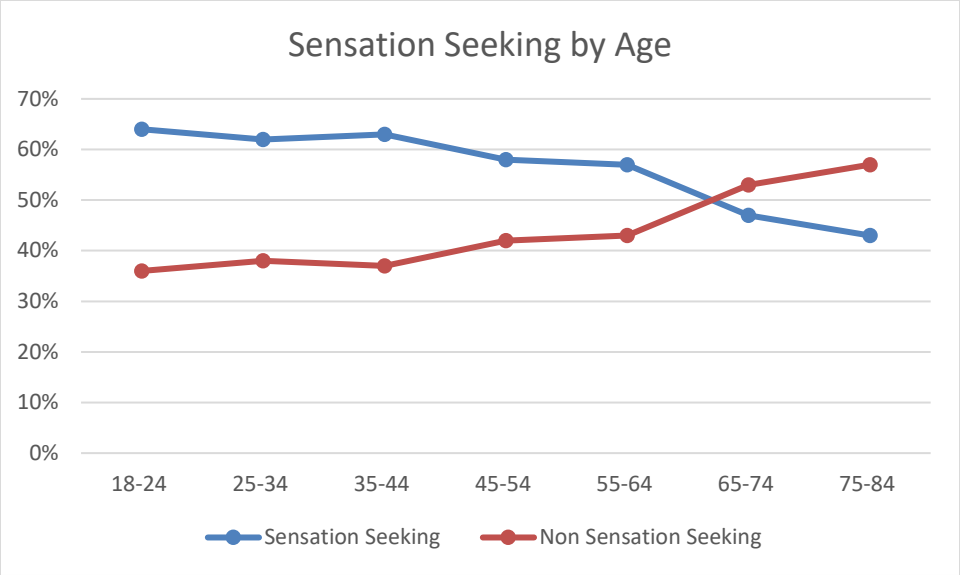

Figure 6: Sensation Seeking by Age

Gender Comparison Results

For the average scores of sensation seeking and gender a T-Test of Independence is used to compare means because the variable for gender is binary. As shown in Table 14 the statistical significance between male and female sensation seeking was .012. In Table 15, males reported a mean sensation seeking score of .6070 on 0-1 scale while females reported .5657 mean sensation seeking score, meaning the men are higher sensation seekers than women.

Table 14: Gender Comparison T-test

Independent Samples Test					
		t-test for Equality of Means			
		Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
					Lower
TOTAL	Equal variances assumed	.012	.04130	.01640	.00907
	Equal variances not assumed	.011	.04130	.01601	.00970

Table 15: Gender Comparison T-test Results

Group Statistics					
	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
TOTAL	Male	332	.6070	.14635	.00803
	Female	102	.5657	.13985	.01385

Discussion

The purpose of this study is to understand the risk-taking behaviors in whitewater kayakers based upon age and the sensation-seeking trait. The results indicate that people who participate in whitewater kayaking are sensation seekers and the sensation-seeking trait is more prominent in younger experienced kayakers. The results of the study offer these conclusions while raising more questions.

As stated earlier, sensation seeking theory states that participation in extreme sports such as whitewater kayaking results from “an inherent need for novel experiences and intense sensations obtained by taking physical risks” (Brymer, 2010). Using the definitions from previous literature, risk is the uncertainty about the outcome of an event or action (Frey, 1991). When discussing risk and personality, Levenson (1990) defined risk taking as any purposive activity that entails novelty or danger sufficient to create anxiety in most people within both physical or social aspects. (p. 1073). Sixty percent of whitewater kayakers are high sensation seekers. This group may produce lower levels of dopamine, and therefore tend to pursue activities that stimulate dopamine production. (Schneider et. Al, 2007). Whitewater kayaking most often occupies the realm of physical risk of injury or death. Using these definitions, respondents of this study do take risks, which is proven by the results of the class of whitewater that respondents run.

As the class of whitewater increases, according to the International scale, risks of injury and death increase (Fiore, 2003). Because the most preferred rapid class is Class IV, kayakers are regularly taking risks while participating in the sport of

whitewater kayaking. Class IV rapids and rivers are classified by the international scale as being difficult. The description describes rapids that are generally longer, steeper with heavy obstruction with powerful and irregular waves. Class IV rapids require precise maneuvering and scouting is required if the rapid is unknown (Fiore, 2003). Coming out of a kayak and swimming through class IV rapids is often consequential and may result in injury or death. These risks are inherent to paddling class IV whitewater. Data further supports the conclusion that kayakers regularly take risks because respondents report that they most often paddle Class V rapids/rivers. Thirty-nine percent answered that they most often paddle Class V rapids or rivers. This suggests that kayakers are often paddling at or above their perceived skill level. Respondents are paddling class V rapids more often than class IV rapids, which they reported preferring to run.

An interesting finding of this study is the difference in the scores of the four subscales of the sensation seeking scale. For all respondents, sixty percent scored as high sensation seekers. Seventy eight percent scored as high sensation seekers on the thrill and adventure seeking subscale, defined as a desire to engage in activities or sports involving some unusual sensations and involving some risks beyond conventional sports (Zuckerman, 2007). Next, seventy-five percent scored as high sensation seekers on the experience seeking scale. Experience seeking indicate openness to new kinds of sensations and experiences through art, music, drugs, and an unconventional lifestyle (Zuckerman, 2007). Conversely, respondents scored lower on the disinhibition and boredom susceptibility subscales. Fifty percent had high scores for

the disinhibition subscale, which is defined as the seeking of exciting sensations and experiences in social situations such as parties, social drinking and sexual activity (Zuckerman, 2007). Finally, only thirty-eight percent scored high on boredom susceptibility, an intolerance for repetitious and predictable kinds of experience in routine work or with dull people, and a restlessness when the individual cannot escape from routine or sameness of stimulation (Zuckerman, 2007).

These results suggest that whitewater kayakers have certain motivations for risk taking while others are not as important. It suggests that a new experience for the experience itself and thrill are factors that determine the pursuit of kayaking and satisfaction. Being bored or disinhibited and social factors play less of a role in respondents risk taking behaviors, according to the results. These findings differ from Frey (1991), who affirms that risk perceptions are based on cultural factors. Perception of risk is related to public reflection of the danger of a situation (Frey, 1991). Even though the scores for DIS and BS subscales are significantly lower than the TAS and ES subscale, it is safe to conclude that all play a role in sensation seeking and risk perception. Social factors indeed do factor into risk perception and the sensation seeking personality trait.

The demographics of respondents in the study were important in gathering a comprehensive understanding of the population. Based on the results, there are far more male kayakers than female. This finding is similar to many other adventure and traditional sports. In Ewert's (2013) study of 801 participants, only 316, or 39% were female. The results also show that males are higher sensation seekers than females.

This result may explain why there are more males involved in adventure sports than females. Next, kayakers who identify as older (55 +) also pale in comparison to those who identify as younger than 55. Eighty-seven percent of respondents reported being younger than 55 years of age. Previous research by Ewert (2013), Levinson (1990), and Schneider et. Al (2007) report samples with respondents under the age of 55 years as well. This may be due to several reasons. The finding supports the hypothesis that older people do not portray themselves as sensation seekers. Health reasons that limit strength or agility may deter an older population from participating as well. Social obligations such as family or work may also deter older people from participating. Previous literature also supports this finding. Brymer (2010) recruited participants for his study within the age range of 30-75 years. He notes that this age group is outside the age range that adventure studies typically focus and study.

The research question explored differences in sensation seeking as it pertains to risk taking between young and old experienced whitewater kayakers. The hypothesis further suggests that younger experienced kayakers will score higher on sensation seeking scale than older experienced kayakers. The results indicate that younger experienced kayakers do score higher on the sensation-seeking scale. For example, 64% of respondents between the ages of 18 and 24 are high sensation seekers. Of the total sample of 18-24 year old kayakers, the average time since beginning the sport is 3.5 years. Sixty-two percent of those between the ages of 25-34 are high sensation seekers while the average time paddling of all 25-34 year olds is 12.5 years. The pattern continues in this way as age increases.

These are different findings from those of Ewert (2010), who found that as experience increases, sensation seeking does as well. Ewert's findings are valid for the study that he conducted because of the participant sample. Ewert did not consider age for this study, but recruited participants from a college based outdoor program, which suggests that the majority of the respondents will be between the ages of 18 and 24 years old (Ewert, 2013). Results showed that extreme sport participants did not see various outdoor activities as risky or dangerous and they did not participate for an adrenaline rush. As people participate in extreme sports, their perception of risk decreases while their perception of skill increases (McLean & Hurd, p.128). This correlation does not mean that the risk of injury or death has decreased. Only one's perception that there is less risk has decreased.

The finding of this study differ in that as age increased, the length of time participants had been participating in the sport of kayaking increased, but sensation seeking, or risk taking behaviors, decreased. This means that older participants of this study did have increased perception of their skill as they had spent more years participating in the sport, but they do not perceive that there is less risk.

Overall, kayaking is a growing recreational activity that has not been researched thoroughly, especially in terms of risk perception. In fact, outdoor recreation as a whole annually accounts for 646 billion dollars in consumer spending, 6.1 million American jobs, and 80 billion dollars in federal, state, and local tax revenues (Outdoor Industry Association, 2016). Understanding the risk involved in outdoor sports and how those who participate or want to learn perceive and deal with risk is essential to better serving

this growing population. This research has identified certain relationships between age and perception. These relationships will be influential in developing and implementing instruction and instructor courses. The development of risk management plans in commercial, non-profit and government recreation programs would also benefit from knowledge presented in the research. As Frey (1991) states, the business of risk analysis, in which professionals assess, regulate and manage risk for public and private entities has become a central part of our culture. (Frey, 1991). The creation of the accident potential model, which is widely used in outdoor recreation programs to aid in the creation of risk management plans, is an example of this risk analysis. The accident potential model considers environmental hazards and human factors. The more overlap between the two factors creates more risk potential (Hale, 1984). Sensation seeking as defined by Zuckerman plays an important role in the definition of the human factor element of the accident potential model. A person who is a high sensation seeker, or possesses the personality to seek out danger and excitement, may be more likely to encounter more environmental hazards, thus creating more likelihood for accidents to occur. As a whitewater kayaking instructor, it is imperative to understand the personalities of clients and students. Knowing what drives a student and how they learn and react to stimuli such as risk allows the instructor to be a more successful teacher. As age increases, sensation seeking decreases. Industry professionals should recognize this relationship and build programs to serve older and younger populations. This would further grow the sport and introduce more individuals with broader

personalities to the world of whitewater kayaking. In turn, the outdoor recreation economy would continue to grow and positively benefit our communities.

CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The research question of this study was tested using SPSS statistical software. Sensation seeking was measured for all respondents and compared by age and gender. The first test indicated that 60.25% scored as having the sensation-seeking trait on the SSS-V. When analyzed by age groups, data analysis revealed that the hypothesis was correct that younger kayakers in this sample score higher on the sensation seeking scale than older experienced kayakers. There is a downward trending correlation of age and sensation seeking in this study. Also, perception of ability and preference of rapid class results indicate that respondents of this study often paddle at or one class above their perceived ability level while whitewater kayaking.

Limitations

The first limitation to consider is the reliability of respondents while answering questions. Since respondents were self-reporting, inflation of paddler ability or paddler preference may have occurred. For example, respondents identified which class rivers they felt that they could paddle as well as which class rivers they most prefer to paddle. This study relied on accurate self-identification according to the international class rating system. The study also relies on the respondents' honesty when answering questions regarding sensation seeking. In addition, the international class rating system is

subjective and is open to interpretation. The majority of rivers have a definitive class rated by American Whitewater. Each individual paddler still interprets each river and rapid differently.

Next, sample size may influence the results of the study. Only 23.5% of respondents were female. Sixty-two percent of respondents most often paddle in the Southeastern region of the United States. While it is common to have more men than women who kayak, these statistics may skew the representation of women. It may also generalize all populations of kayakers with results largely reporting from the Southeast. More respondents from various geographic regions are needed.

Lastly, method of outreach is a limitation. Using social media may not reach every whitewater kayaker and it may limit the sample size.

Future research should test on participants under the age of 18. It would be interesting to compare sensation seeking in adolescents and adults in different age groups.

Recommendations

Recognizing that personality only plays a small part in risk perception allows for opportunities for future research in whitewater kayakers. While personality and sensation seeking does play a part, there are several other factors that also influence risk perception, including sociological factors and cultural influences.

Inclusion of minors in future research to compare adolescent sensation seeking to adult sensation seeking would provide more understanding in the sport. To test a

group of paddlers throughout their progression and career of whitewater kayakers would also be interesting.

One aspect that was not examined in this research was the difference of rivers in the different regions of the US. While southern rivers have less volume and more rocks, western rivers typically have more water and fewer rocks, which carries different risk of injury and death. Does the type of river affect the risk that kayakers are willing to take?

The social aspect of whitewater kayaking should also be researched further. Does being a member of the larger community of whitewater kayakers influence paddlers to take more risk? How do group dynamics sway and influence risk taking and decision making in kayakers?

Research on risk perception would not only help us better scientifically understand the sport but also advance teaching techniques, aid in policymaking and strengthen relationships between landowners and user groups.

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APPENDIX

Appendix 1: IRB Approval Letter

THE UNIVERSITY OF TENNESSEE KNOXVILLE

October 12, 2016

Lisa Marie Ivester,
UTK - Kinesiology Recreation & Sport Studies

Re: UTK IRB-16-03245-XP
Study Title: Risk Perception Among Experienced Whitewater Kayakers

Dear Lisa Marie Ivester:

The UTK Institutional Review Board (IRB) reviewed your application for the above referenced project. It determined that your application is eligible for expedited review under 45 CFR 46.110(b)(1), category (7). The IRB has reviewed these materials and determined that they do comply with proper consideration for the rights and welfare of human subjects and the regulatory requirements for the protection of human subjects.

Therefore, this letter constitutes full approval by the IRB of your application (version 1.1) as submitted, including Informed Consent Form (v1.1), Invitation to Participate in Survey (v1.0) and the Survey (v2.0). The listed documents have been dated and stamped IRB approved. Approval of this study will be valid from October 12, 2016 to October 11, 2017.

In the event that subjects are to be recruited using solicitation materials, such as brochures, posters, web-based advertisements, etc., these materials must receive prior approval of the IRB. Any revisions in the approved application must also be submitted to and approved by the IRB prior to implementation. In addition, you are responsible for reporting any unanticipated serious adverse events or other problems involving risks to subjects or others in the manner required by the local IRB policy.

Finally, re-approval of your project is required by the IRB in accord with the conditions specified above. You may not continue the research study beyond the time or other limits specified unless you obtain prior written approval of the IRB.

Sincerely,

Colleen P. Gilrane

Colleen P. Gilrane, Ph.D.
Chair

Institutional Review Board | Office of Research & Engagement
1534 White Avenue Knoxville, TN 37996-1529
865-974-7697 865-974-7400 fax irb.utk.edu

Appendix 2: Invitation to Participate in Study

Hello, my name is Lisa Ivester and I am currently a master's student at the University of Tennessee conducting thesis research.

I am reaching out to you as a member of the whitewater community and would like to invite you to participate in a research regarding the perceptions risk involved in whitewater kayaking.

The survey will take approximately 10-15 minutes. This research requires your informed consent, which you will read before the survey begins. You may skip any question(s) that you do not wish to answer and you are free to end the survey at any time by simply closing your web browser.

Link to survey:

If you have any questions at any time about the study or procedures or you experience adverse effects as a result of participating in the study, you may contact the researcher, Lisa Ivester, at 2111 Volunteer Blvd, Knoxville, TN 37996 and/or (865)-974-4214. If you have questions about you rights as a participant, please contact the Office of Research Compliance Officer at (865)-974-7697.

I believe that a better understanding of risk perception will provide adventure educators and kayak instructors with an improved framework to teach kayaking. Understanding motivations and risks of user groups may also aid in policymaking and public land planning as well as assist in the public knowledge of the sport of whitewater kayaking.

Thank you for your time and willingness to assist me in this research.

Sincerely,

Lisa Ivester

Appendix 3: Informed Consent

Sensation Seeking Among Experienced Whitewater Kayakers

INTRODUCTION
James Bemiller, JD and Lisa Ivester are inviting you to take part in a research study. James Bemiller is a professor at University of Tennessee. Lisa Ivester is a graduate student at University of Tennessee, running this study with the help of James Bemiller. The purpose of this research is to determine risk perceptions and sensation seeking among whitewater kayakers.

INFORMATION ABOUT PARTICIPANTS' INVOLVEMENT IN THE STUDY

Your part in the study will be to complete a self-reporting survey.
It will take you about 10-15 minutes to be in this study.

RISKS
Although risks are very minimal, you may experience discomfort when responding to some of the questions asked by the researcher.

BENEFITS
There are no anticipated direct benefits to you resulting from your participation in the research. This study may help us to understand how whitewater kayakers perceive risk and make decisions regarding risk. It is the design of this study to measure how kayakers of different ages score on the sensation seeking scale.

CONFIDENTIALITY
You will be asked to provide personal information such as your age, sex, the region of the United States you most identify with, and what classification of whitewater you are most confident in paddling. Your name will not be collected in the survey. Your privacy is of paramount concern to the researchers and we will do everything we can to protect your privacy and confidentiality. We will not tell anybody outside of the research team that you were in this study or what information we collected about you in particular.

CONTACT INFORMATION
If you have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study,) you may contact the researcher, Lisa Ivester, at lisai@vols.utk.edu and 865-974-4214 or his/her advisor, James Bemiller (for student studies) at jimb@utk.edu. If you have questions about your rights as a participant, you may contact the University of Tennessee IRB Compliance Officer at utkirb@utk.edu or (865) 974-7697.

PARTICIPATION
Your participation in this study is voluntary; you may decline to participate without

penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will not be saved or submitted to the study. You will be asked to provide information regarding your experiences, preferences and demographic information such as gender, age and region of activity.

CONSENT

- o I have read the above information and I agree to participate in this study

Appendix 4: Survey Tool

1. How often do you participate in whitewater kayaking?
   - o Once a month
   - o 2-5 times a month
   - o 6-10 times a month
   - o 10+ times a month

2. What level of difficulty rapids/rivers do you most prefer to paddle?
   - o Class I
   - o Class II
   - o Class III
   - o Class IV
   - o Class V
   - o Class VI

3. What level of difficulty rapids/rivers do you feel that you are able to paddle?
   - o Class I
   - o Class II
   - o Class III
   - o Class IV
   - o Class V
   - o Class VI

4. How long have you been whitewater kayaking?
   _____years
   _____months

5. In which region of the US do you most often paddle?
   - o New England - CT, ME, MA, NH, RI, VT
   - o Mid Atlantic – NJ, NY, PA
   - o Midwest – IL, IN, MI, OH, WI, IA, KS, MN, MO, NE, ND, SD
   - o South – FL, GA, MD, NC, SC, VA, WV AL, KY, MI, TN, AR, LS, OK, TX
   - o West – AZ, CO, ID, MT, NV, NM, UT, WY
   - o Pacific – AL, CA, OR, WA, HI

6. What is your age?
   - o 18-24
   - o 25-34
   - o 35-44
   - o 45-54
   - o 55-64
   - o 65+

7. What is your gender?
    - o Male
    - o Female
    - o Other

8. How were you introduced to whitewater kayaking?
    - o Family member
    - o Friends
    - o Self discovery/Self taught
    - o Professional Lessons
    - o Commercial rafting experience
    - o Collegiate or non-profit outdoor program
    - o Other_____

Directions: Each of the items below contains two choices, A and B. Please circle the letter of the choice which most describes your likes or the way you feel. In some cases you may find items in which both choices describe your likes or feelings. Please choose the one which better describes your likes or feelings. In some cases you may find items in which you do not like either choice. In these cases mark the choice you dislike least. Do not leave any items blank.
It is important you respond to all items with only one choice, A or B. We are interested only in your likes or feelings, not in how others feel about these things or how one is supposed to feel. There are not right or wrong answers as in other kinds of tests. Be frank and give your honest appraisal of yourself.

9. Choose one answer.
    - o I like wild and uninhibited parties.
    - o I prefer quiet parties with good conversation.

10. Choose one answer.
    - o I get bored seeing the same old faces.
    - o I like the comfortable familiarity of everyday friends.

11. Choose one answer.
    - o I like to explore a new area, river or strange city by myself, even if it means getting lost.
    - o I prefer a guide when I am in a place I don't know well.

12. Choose one answer.
    - o I dislike people who do or say things just to shock or upset others.
    - o When you can predict almost everything a person will do or say, he/she must be a bore.
13. Choose one answer.

- o I usually don't enjoy a movie where I can predict what will happen in advance.
- o I don't mind watching a move where I can predict what will happen in advance.

14. Choose one answer.
    - o A sensible person avoids activities that are dangerous.
    - o I sometimes like to do things that are a little frightening.

15. Choose one answer.
    - o I like to try new foods that I have never tasted before.
    - o I order the dishes with which I am familiar, so as to avoid disappointment.

16. Choose one answer.
    - o I have tried or would like to try kite surfing.
    - o I would not like to try kite surfing.
    - o

17. Choose one answer.
    - o I would like to take off on a trip with no pre-planned or definite routes or time tables.
    - o When I go on a trip I like to plan my route and time table fairly carefully.

18. Choose one answer.
    - o I would not like to learn to fly an airplane.
    - o I would like to learn to fly and airplane.

19. Choose one answer.
    - o I prefer the surface of the water to the depths.
    - o I have been or would like to go scuba diving.

20. Choose one answer.
    - o I prefer friends who are excitingly unpredictable.
    - o I prefer friends who are reliable and predictable.

21. Choose one answer.
    - o I am not interested in experience for its own sake.
    - o I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal.

22. Choose one answer.
    - o The essence of good art is in its clarity, symmetry of form and harmony of colors.
    - o I often find beauty in the "clashing" colors and irregular forms of modern paintings.

23. Choose one answer.
    - o I enjoy spending time in the familiar surroundings of home.
    - o I get very restless if I have to stay around home for any length of time.

24. Choose one answer.
    - o I have been or would like to go skydiving.
    - o I would never want to try jumping out of a plane with or without a parachute.

25. Choose one answer.
    - o I like to date people who are physically exciting.
    - o I like to date people who share my values.

26. Choose one answer.
    - o Even if I had the money, I would not care to associate with rich persons like those in the “jet set” lifestyle.
    - o I could conceive of myself seeking pleasures around the world with the “jet set” lifestyle.

27. Choose one answer.
    - o I feel best after taking a couple of drinks.
    - o Something is wrong with people who need alcohol to feel good.

28. Choose one answer.
    - o People should dress according to some standard of taste, neatness and style.
    - o People should dress in individual ways even if the effects are sometimes strange.

Appendix 5: Full Sensation Seeking Test

1. A. I like “wild” uninhibited parties
   B. I prefer quiet parties with good conversation
2. A. There are some movies I enjoy seeing a second or even a third time
   B. I can’t stand watching a movie that I’ve seen before
3. A. I often wish I could be a mountain climber
   B. I can’t understand people who risk their necks climbing mountains
4. A. I dislike all body odors
   B. I like some for the earthly body smells
5. A. I get bored seeing the same old faces
   B. I like to comfortable familiarity of everyday friends
6. A. I like to explore a strange city or section of town by myself, even if it means getting lost
   B. I prefer a guide when I am in a place I don’t know well
7. A. I dislike people who do or say things just to shock or upset others
   B. When you can predict almost everything a person will do and say he or she must be a bore
8. A. I usually don’t enjoy a movie or play where I can predict what will happen in advance
   B. I don’t mind watching a movie or a play where I can predict what will happen in advance
9. A. I have tried marijuana or would like to
   B. I would never smoke marijuana
10. A. I would not like to try any drug which might produce strange and dangerous effects on me
    B. I would like to try some of the new drugs that produce hallucinations
11. A. A sensible person avoids activities that are dangerous
    B. I sometimes like to do things that are a little frightening
12. A. I dislike “swingers” (people who are uninhibited and free about sex)
    B. I enjoy the company of real “swingers”
13. A. I find that stimulants make me uncomfortable
    B. I often like to get high (drinking liquor or smoking marijuana)
14. A. I like to try new foods that I have never tasted before
    B. I order the dishes with which I am familiar, so as to avoid disappointment.

15. A. I enjoy looking at home movies or travel slides
    B. Looking at someone's home movies or travel slides bores me tremendously
16. A. I would like to take up the sport of water skiing
    B. I would not like to take up water skiing
17. A. I would like to try kite surfing
    B. I would not like to try kite surfing.
18. A. I would like to take off on a trip with no preplanned or definite routes, or timetable
    B. When I go on a trip I like to plan my route and timetable fairly carefully
19. A. I prefer the "down to earth" kinds of people as friends
    B. I would like to make friends in some of the "far out" groups like artists or "punks"
20. A. I would not like to learn to fly an airplane
    B. I would like to learn to fly an airplane
21. A. I prefer the surface of the water to the depths
    B. I would like to go scuba diving
22. A. I would like to meet some persons who are homosexual (men or women)
    B. I stay away from anyone I suspect of being "gay or lesbian"
23. A. I would like to try parachute jumping
    B. I would never want to try jumping out of a plane with or without a parachute
24. A. I prefer friends who are excitingly unpredictable
    B. I prefer friends who are reliable and predictable
25. A. I am not interested in experience for its own sake
    B. I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal
26. A. The essence of good art is in its clarity, symmetry of form and harmony of colors
    B. I often find beauty in the "clashing" colors and irregular forms of modern paintings
27. A. I enjoy spending time in the familiar surroundings of home
    B. I get very restless if I have to stay around home for any length of time
28. A. I like to dive off the high board
    B. I don't like the feeling I get standing on the high board.
29. A. I like to date members of the opposite sex who are physically exciting
    B. I like to date members of the opposite sex who share my values

30. A. Heavy drinking usually ruins a party because some people get loud and boisterous
    B. Keeping the drinks full is the key to a good party
31. A. The worst social sin is to be rude
    B. The worst social sin is to be a bore
32. A. A person should have considerable sexual experience before marriage
    B. It's better if two married persons begin their sexual experience with each other
33. A. Even if I had the money I would not care to associate with flight rich persons like those in the "jet set"
    B. I could conceive of myself seeking pleasures around the world with the "jet set"
34. A. I like people who are sharp and witty even if they do sometimes insult others
    B. I dislike people who have their fun at the expense of hurting the feelings of others
35. A. There is altogether too much portrayal of sex in movies
    B. I enjoy watching many of the "sexy" scenes in movies
36. A. I feel best after taking a couple of drinks
    B. Something is wrong with people who need liquor to feel good
37. A. People should dress according to some standard of taste, neatness, and style
    B. People should dress in individual ways even if the effects are sometimes strange
38. A. Sailing long distances in small sailing crafts is foolhardy
    B. I would like to sail a long distance in a small but seaworthy sailing craft
39. A. I have no patience with dull or boring persons
    B. I find something interesting in almost every person I talk to
40. A. Skiing down a high mountain slope is a good way to end up on crutches
    B. I think I would enjoy the sensations of skiing very fast down a high mountain slope

VITA

Lisa Ivester received her Bachelors of Science in Parks, Recreation and Tourism Management from Clemson University in 2014 where she chose to begin pursuing outdoor education as a career. Lisa has worked for many outdoor programs in South Carolina, Wyoming, Idaho, Colorado and Tennessee. Lisa is now pursuing her Masters of Science in Recreation and Sport Management at University of Tennessee and works with the Outdoor Program within the RecSports Department on campus. She expects to earn her degree in 2017.